



Insurance, Nanotechnology, and Risk

John C. Monica, Jr.

porterwright

www.nanolawreport.com

(202)778-3050

jmonica@porterwright.com

October 6, 2009

Arlington, Virginia

National Nanotechnology Initiative Workshop

**“Nanomaterials and the Environment
& Instrumentation”**

Potential Environmental, Health, and Safety Concerns

There is some evidence that certain nanoscale materials may present environmental, health, and safety risks under certain conditions.

The primary focus is on inhalation and possible translocation risks of carbon-based and/or metal-based nanoscale materials such as carbon nanotubes, fullerenes, and nanoscale silver, titanium, and zinc particles.

There are some dermal penetration and translocation concerns.

There are some environmental contamination concerns. The initial environmental focus is on nanoscale silver, carbon-based nanoscale materials, and other metal-based nanoscale materials.

Nanomaterials Hazard Questions

Do **any** engineered nanomaterials represent a human and/or environmental health hazard under **some/all** conditions?

Specific toxicity.

Do **all** engineered nanomaterials represent a human and/or environmental health hazard under **some/all** conditions?

Generic toxicity.

How do you provide scientific answers to these questions?

How do businesses operate in an environment where answers to these questions remain incomplete?

How do you insure? (From perspectives of both the insurer and the insured)

DON'T PANIC!



Nanotechnology is coming. You can't stop it. But can you insure it?

Nanotechnology: building things on a molecular scale. 10^{-9} meter. This teeny technology could change the nature of every man-made object — and open up some huge product liability issues. So, what do you know about Buckyballs, Fullerines, and carbon nanotubes? What does a quantum dot do? What are the chances of nanobiohazards running amuck?

ISO, THE LEADER IN DEVELOPING STANDARDIZED POLICY PROGRAMS, IS ON IT.

One of the Core Services we offer is identifying future concerns for insurers in the realm of property/casualty risk. We're constantly monitoring emerging trends — like nanotechnology — that could affect your business in the coming months, years, or even decades.



As the situation develops, we modify our policy forms and rules to help you stay ahead of the changes. Giving you the opportunity to enter new lines of business and create new markets. And reducing your company's risk factor to nanolevels. To learn more, call 1-800-888-4476 or visit iso.com.

ISO CORE SERVICES

- Aggregate insurance statistics
- Advisory prospective loss costs
- Policy forms and rules
- Actuarial products

FREE WEB SEMINAR SERIES

Go to www.iso.com/webseminars to learn about "Making ISO Products Work for You."

Data, Analytics, and Decision Support.



© ISO Properties, Inc., 2007. ISO and the ISO logo are registered trademarks of ISO Properties, Inc.

Three Phases of Nanotechnology

Insurance

- Early Study Period. The insurance industry is currently in this stage, which is an effort to assess potential risks and insurance exposures. During this period, nanotechnology risks **may** already be covered by product liability, worker's compensation, professional liability, and general liability insurance policies.
- Apprehensive Phase. Serious concerns develop and “insurers and reinsurers begin to look at reducing” coverage. The industry seeks to contain risks through the use of “sub-limits” and “claims made” coverage.
- Mature Phase. Insurers understand the risks and potential losses posed by nanotechnology and offer “customized solutions”...“at reasonable rates in both the insurance and reinsurance markets.”

Unfamiliar Exposure, Insurance Networking News
Robert Blaunstein, Ph.D. November 2006 <http://TinyURL.com/ktucy3>

Five Approaches by Insurers

David Baxter

Nanotechnology: an insurer's perspective

www.safenano.org



Nanotechnology: An insurer's perspective

David Baxter, Lead Researcher, Emerging Risks, Lloyd's of London

Where does insurance fit into the world of nanotechnology?

Insurance is the transfer of a risk for which the insurer charges a fee. For example, employers' liability insurance cover requires the insurer to pay for any injuries incurred by an employee in the course of their employment. The cost to the company is the premium paid each year for the insurance plus an agreed minimum amount, or deductible, paid in the event of any claim. Generally all costs greater than the deductible will be met by the insurer. This begs the question, how does the insurer manage the risk they have assumed from the company? Insurers can take on risk from many different companies and pool it. Assuming they have a good estimate of the probability of each company claiming on its insurance policy the insurer can estimate the average cost of claims each year from all of its policies. For many types of insurance, the more policies the insurer has, the more likely the predicted cost of all claims will match the actual cost of all claims; this is known to many as the "law of large numbers". Therefore in theory, an insurer with a large number of policies can predict how much they would have to pay out each year and will set the cost of the insurance premium to cover those predicted losses.

This business model hinges on the assumption that the probability of the risk occurring has been accurately calculated. This calculation can be performed in many ways and a typical method within the insurance industry is for actuaries to analyse historical data. An insurer can be more confident of the probability and impact of a risk that has been insured and studied for many years and where changes of the nature of the risk are slow or predictable. A good example of this is motor insurance. The number of cars and accidents on the road changes relatively slowly year on year and the motor insurance industry has existed for over 100 years. Nanotechnology on the other hand can give an insurer pause for thought, as historical data does not exist and the level of knowledge is changing rapidly. The use of scientific research coupled with insurance experience may help, but a common theme in nanotechnology risk assessment is that there is lack of data to understand the exposure or even the hazard itself.

How can insurers manage the risk?

There are several options available to insurers when attempting to insure a risk that is difficult to quantify. To our knowledge explicit measures are not commonly used to control nanotechnology risks. However, some of the options available to insurers are summarised below:

Monitor and research

This could be considered the first stage in assessing an emerging risk. There are many resources available to insurers to research risks, ranging from web resources like www.safenano.org to organisations like the Lighthill Risk Network (see the case study). By monitoring the risk the insurer can help to ensure their terms and conditions match the prevailing level of known risk. There is a danger, however, that a risk may be changing in ways that are not yet apparent in current thinking and research.

Case Study: Lighthill risk network

The [Lighthill Risk Network](http://www.lighthillrisknetwork.org), is run as a not-for-profit organisation bringing together scientific research worldwide, the financial services and governments to exchange risk-related expertise.

On the 10 December 2007 the network hosted a conference on nanotechnology in the Old Library at Lloyd's. The conference presented academic views of issues around nanotechnology to the Lloyd's and wider insurance community. These included the law and regulation, nanotoxicology and current and future applications. In addition, the network helped identify experts for the Lloyd's Emerging Risk report on nanotechnology which was launched at the event in December, and can be found at www.lloyds.com/emergingrisks.

“Nanotechnology: An Insurer's Perspective”

David Baxter, Lead Researcher, Emerging Risks, Lloyd's of London

<http://tinyurl.com/nzhjuk>

Five Approaches by Insurers

1. Monitor and research emerging risks. Lloyd's notes this approach cannot fully account for the danger of unforeseen, unanticipated risks.
2. Price adequately and hold additional capital. Under this scenario, an insurer would (i) not treat nanotechnology as a separate risk, (ii) increase premium prices to encompass any new risk, and (iii) increase capital reserves accordingly.
3. Exclude. Lloyd's notes that insurers could choose to totally exclude coverage for nanotechnology businesses. In that case, Lloyd's maintains that exclusions must be **well-worded** and enforceable to be effective. Lloyd's also notes that the downside to this approach is that it "does not allow the insurer to acquire historical data to price for allowing cover in the future."

Five Approaches by Insurers

4. Exclude and write back with limited cover. Under this scenario, an insurer would exclude nanotechnology from full coverage and then provide written separate limited coverage for those risks.
5. Only accept claims within a fixed period. This approach would protect insurers against latent claims that appear years after a policy is written.

(Some can be used in combination)

First Commercial Exclusion

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY

NANOTUBES AND NANOTECHNOLOGY EXCLUSION

This endorsement modifies insurance provided under the following:

BUSINESS AUTO COVERAGE FORM
BUSINESSOWNERS COVERAGE FORM
GARAGE COVERAGE FORM
MOTOR CARRIER COVERAGE FORM
COMMERCIAL GENERAL LIABILITY COVERAGE PART
COMMERCIAL LIABILITY UMBRELLA COVERAGE PART

Nanotubes and Nanotechnology

A. This insurance does not apply to:

1. "Bodily injury", "property damage", or "personal and advertising injury" related to the actual, alleged, or threatened presence of or exposure to "nanotubes" or "nanotechnology" in any form, or to harmful substances emanating from "nanotubes" or "nanotechnology". This includes the use of, consumption of, ingestion of, inhalation of, absorption of, contact with, existence of, presence of, proliferation of, discharge of, dispersal of, seepage of, migration of, release of, escape of, or exposure to "nanotubes" or "nanotechnology". Such injury from or exposure to "nanotubes" or "nanotechnology" also includes, but is not limited to:
 - a. The existence, storage, handling or transportation of "nanotubes" or "nanotechnology";
 - b. The removal, abatement or containment of "nanotubes" or "nanotechnology" from any structures, materials, goods, products, or manufacturing process;
 - c. The disposal of "nanotubes" or "nanotechnology";
 - d. Any structures, manufacturing processes, or products containing "nanotubes" or "nanotechnology";
 - e. Any obligation to share damages with or repay someone else who must pay damages because of such injury or damage;
 - f. Any product manufactured, sold, handled or distributed by or on behalf of the insured which contains "nanotubes" or "nanotechnology"; or
 - g. Any supervision, instructions, recommendations, warranties (express or implied), warnings or advice given or which should have been given.

2. Any loss, cost or expense including, but not limited to, payment for investigations or defense, fines, penalties, interest and other costs or expenses, arising out of any:

- a. Claim, "suit", demand, judgment, obligation, order, request, settlement, or statutory or regulatory requirement that any insured or any other person or entity test for, monitor, clean up, remove, contain, mitigate, treat, neutralize, remediate, or dispose of, or in any way respond to, or assess the actual or alleged effects of "nanotubes" or "nanotechnology"; or

- b. Claim, "suit", demand, judgment, obligation, request, or settlement due to any actual, alleged, or threatened injury or damage from "nanotubes" or "nanotechnology" or testing for, monitoring, cleaning up, removing, containing, mitigating, treating, neutralizing, remediating, or disposing of, or in any way responding to or assessing the actual or alleged effects of, "nanotubes" or "nanotechnology" by any insured or by any other person or entity; or

- c. Claim, "suit", demand, judgment, obligation, or request to investigate which would not have occurred, in whole or in part, but for the actual or alleged presence of or exposure to "nanotubes" or "nanotechnology".

This exclusion applies regardless of who produced, installed, used, owned, sold, distributed, handled, stored or controlled the "nanotubes" or "nanotechnology".

B. The following definitions are added:

"Nanotubes" means hollow cylinders of carbon atoms or carbon fibers or any type or form of "nanotechnology" which contain remarkable strength and electrical properties used in any products, goods, or materials.

"Nanotechnology" means engineering at a molecular or atomic level.

"Nanotubes and Nanotechnology Exclusion"

September 2008

<http://tinyurl.com/mmkrqa>

First Commercial Insurance Exclusion

- September 2008
- Acadia Ins. Co.; Continental Western Ins. Co.; Fireman's Ins. Co. of Washington, D.C.; Union Ins. Co.
- Aimed at Carbon Nanotubes
- Driven by Poland/Donaldson *Nature Nanotechnology* study
- Also driven by Woodrow Wilson International Center for Scholar's Project on Emerging Nanotechnologies' Consumer Product Inventory
- Quickly Removed (can still find on www.nanolawreport.com)

Continental Western (Intent)

It “would not be prudent for us to knowingly provide coverage for risks that are, as of yet, unknown and unquantifiable. We are all too aware of what happened to companies involved with **asbestos-related exposure** in the past, and see this as a very similar issue.”

*Nanolawreport, First Commercial Insurance Exclusion for Nanotechnology,
<http://tinyurl.com/mlxyg3>*

Continental Western (Exclusion)

This “endorsement excludes bodily injury, property damage, and personal and advertising injury related to the exposure of nanotubes and nanotechnology in any form. This include the use of, contact with, existence of, presence of, proliferation of, discharge of, dispersal of, seepage of, migration of, release of, escape of, or exposure to nanotubes **or nanotechnology.**”

*Nanolawreport, First Commercial Insurance Exclusion for Nanotechnology,
<http://tinyurl.com/mlxyg3>*

<http://www.carbonnanotubeattorney.com/>



CARBON NANOTUBE ATTORNEY

One of the emerging and very disturbing discoveries about certain people who suffer lung problems is exposure to nano tubes. These carbon based tubes are increasingly being used in a wide variety of applications, and can be found in many different areas and places that people go every single day. Nano tubes are used in many types of medical machinery, for example, but are also frequently used to strengthen many common items such as bicycle frames and a huge variety of other things.

Nano tubes, especially the type of a long, thin variety, are thought to have **very similar properties to the much-feared and famously deadly asbestos**. As you are probably aware, asbestos is the leading culprit for the disease known as mesothelioma, which generally affects the lungs of people who have been exposed to asbestos and does not usually produce obvious symptoms until decades after the initial exposure.

This same phenomenon is feared to be true of nano tubes, as well. Because nanotubes look so incredibly similar to asbestos particles, it is believed that they can **burrow unseen into victims' lungs and gradually cause mesothelioma**. This means that you can be diagnosed with mesothelioma, be absolutely certain that you were never exposed to asbestos, and be left quite puzzled as to how you contracted the deadly disease.

<http://www.carbonnanotubeattorney.com/>




CARBON NANOTUBE ATTORNEY

Do you suffer from mesothelioma that has occurred despite no obvious exposure to asbestos? If so, there is a very real possibility that you were - or continue to be - routinely exposed to nano tubes. **These nano tubes, which are microscopic and can not be seen by the naked eye, could very well have attacked your lungs and caused the horrible symptoms of mesothelioma which you are now suffering.** And the worst part is that this exposure could have primarily occurred many years ago; like asbestos exposure, the outward symptoms may have taken years to present themselves.

Fortunately, there are many attorneys who are learning about and becoming skilled at helping victims of nano tube exposure. As this phenomenon is becoming increasingly well known, **many lawyers are studying about and finding ways to fight back against the manufacturers of nano tubes which have potentially destroyed the health of a huge number of unwitting and innocent people.** Finding an attorney who is knowledgeable about nano tube exposure and its relationship with mesothelioma is an incredibly important task for **anyone who wants to have their day in court against this silent killer.**

If you suffer from undiagnosed lung problems, or if you have already been diagnosed with mesothelioma but do not believe it to be caused by asbestos exposure, then you should consider the aid of a professional attorney who is familiar with this unfortunate phenomenon.



What should insureds be doing as they explore using new nanoapplications?

Three First Steps.

Continuum.

Check Existing OSHA Compliance

Make sure existing workplace practices are in compliance with all existing federal laws and guidelines.

If insured does not have at least this level of protection securely in place, they are adding an entirely new level of risk if nanoscale materials are added into the equation.

Get a documented facility check-up.

Toxicity Literature Review

Compile, review, and create a summary report on existing toxicity and exposure studies (if any) for the specific nanoscale materials being used. **Get as close as you can.**

Take into consideration the end application, and all processing or manufacturing methods used in the facility.

Use qualified professional consultants if necessary.

Have the report updated on a regular basis.

Importance of Review

Make informed decisions on whether or not it makes sense to use a particular nanoscale material in a certain application given any potential known nano-related EHS risks.

Insureds have a legal duty to know the potential toxicity of their products as used in reasonably foreseeable applications. This is not unique to nanotechnology.



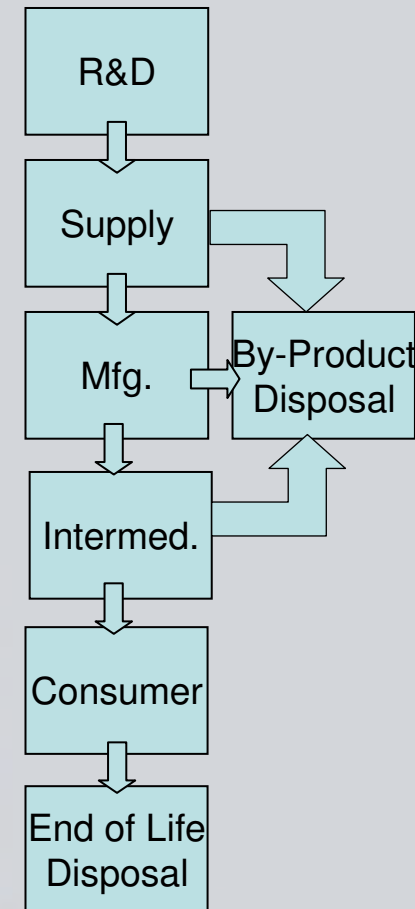
Document Efforts

Document the insured's continued interest in monitoring nano-related EHS developments.

Keep a specific nano-related EHS file or collection.

Conduct a Full Nano-Product Legal Life Cycle Analysis

- Insurance Coverage Issues
- Product & Tort Liability
- Government Regulation
- Commercial & Contractual Liability
- Intellectual Property (Patents, trademarks & trade secrets)
- Workplace & Occupational Liability





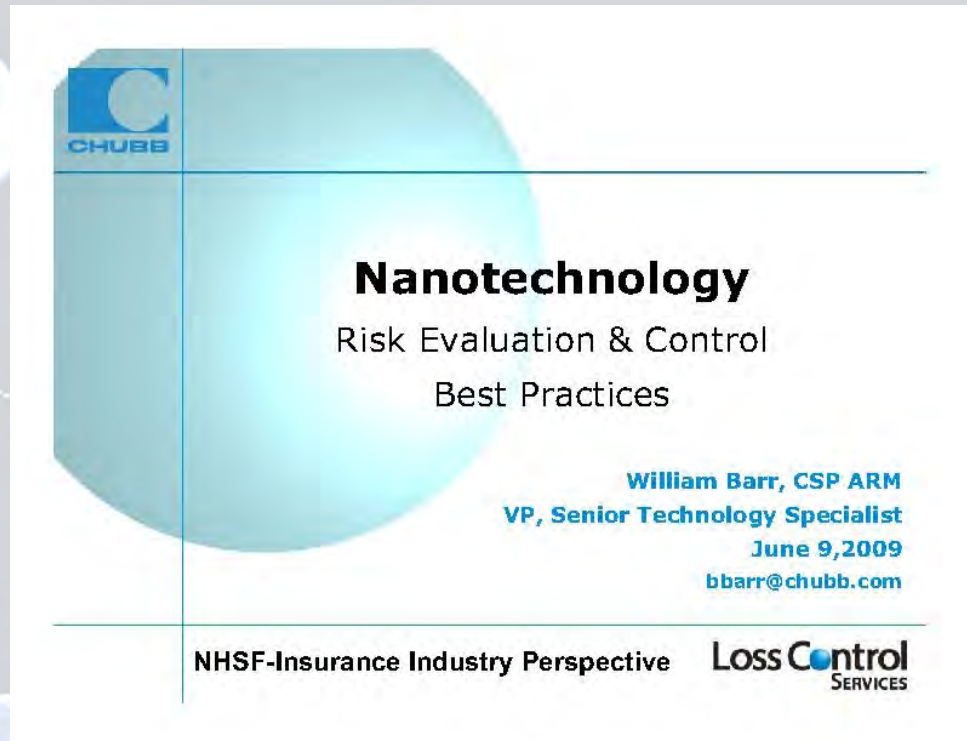
Frontline Insurers Examples of Recent Activities

Chubb

Zurich

Chubb Group of Insurance Companies

Standard business practice to examine the internal operations of a certain percentage of potential insureds to ensure compliance with workplace and occupational best practices including nano-based insureds.



<http://tinyurl.com/l89m3w>

Chubb



Favorable Risk Characteristics

- Informed and involved management
- Pervasive risk management philosophy
- Strong E H & S interaction at all levels
- Adherence to NIOSH best practices
- Strong engineering controls
- Strong emphasis on the employee education for administrative controls
- Enforced policies and procedures
- Thorough incident investigation

12

Loss Control
SERVICES

Zurich

June 2009



<http://tinyurl.com/lh2yuo>

“Zurich keeps close watch on regulatory proposals around the world, and seeks to inform the debate whenever a management perspective seems needed.”

“A clear and consistent set of parameters could go a long way in supporting a safe and innovative nanotechnology industry.”

Zurich Nanotechnology Exposure Protocol TM (ZNEP)TM

- Help Zurich better understand the nano-risk exposures of its customers.
- Help form a global overview of nanotechnology and various facets of risk.
- Collaboration with Intertox in Seattle after looking for a group that understood business needs and context.
- Designed to shorten lag time between discovery and insurability.

Zurich Nanotechnology Exposure Protocol TM (ZNEP)TM

- Protocol itself is proprietary, but it draws upon the most recent and credible nanotechnology toxicity research from around the world.
- Research is analyzed and translated into logic and algorithms to directly apply finding to insurance and risk management decisions.
- Supports individual account risk management and portfolio accumulation management.

www.twitter.com/nanolaw

<http://www.linkedin.com/in/johnmonica>

John C. Monica, Jr.

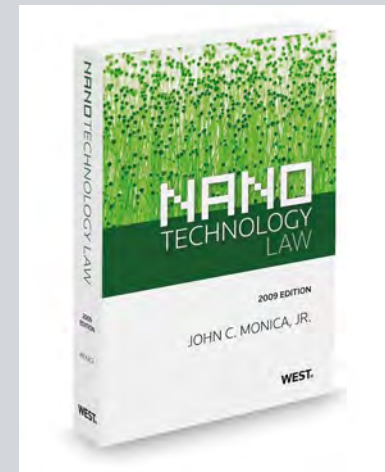
porterwright

(202)778-3050

jmonica@porterwright.com



www.nanolawreport.com



<http://tinyurl.com/y93cmuj>

Germanium Nanobead image provided by UT-Battelle, which manages Oak Ridge National Laboratory for the Department of Energy.